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(71)Applicant : FUTABA CORP

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(72)Inventor : ITO SHIGEO

YAMAURA TATSUO

IWASE HIROYUKI

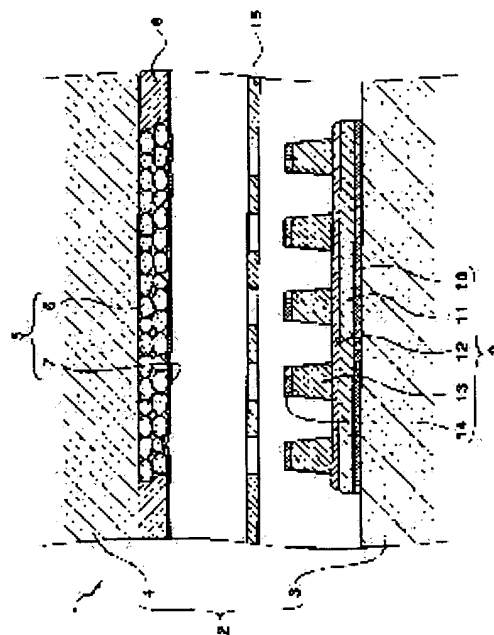
TANAKA GENTARO

## (54) FIELD EMISSION DISPLAY ELEMENT AND ITS MANUFACTURE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a field emission display element capable of mass-production with high yield.

SOLUTION: A phosphor layer 6 and a metal back layer 7 to which high anode voltage of several kilo volts is applied are provided on the inner surface of an anode substrate 4 of an enclosure 2. A field emission element 9 on the inner surface of a cathode substrate 3 has a cathode electrode 10 corresponding to one picture element of anode, a resistance layer 11, an emission layer 12 selected in linkage with the cathode electrode 10, and a gate electrode 14. The emission layer 12 consists of a carbon nanotube or the like. A focusing electrode 15 is present between an anode 5 and the field emission element 9. Drive operation is performed under a relation of voltage  $V_a$  of the anode 5 > voltage  $V_f$  of the focusing electrode 15 > voltage  $V_g$  of the gate electrode 14. Electrons are emitted from the emission layer 12 by the electric field of the gate electrode 14. While the distance between the anode and the cathode substrates is kept long to prevent a spark caused by high anode voltage, electrons collide with a specified portion of the anode 5 without



diffusing before reaching the anode 5 to emit the light from the phosphor layer 6 because of the presence of the focusing electrode 15 with electric potential being higher than that of the gate electrode 14.

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## LEGAL STATUS

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